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KICKAPOO ENVIRONMENTAL OFFICE

The Green Clan

Drought & Air Pollution

Droughts have occurred throughout the history of our Earth, but they may be getting worse. New studies have provided insights into the relationship between air pollution and drought.

Drought can increase air pollution. Because of the extremely dry conditions during a drought, the wind picks up and circulates more atmospheric dust. Under drought conditions in warm weather, temperatures tend to rise to extreme levels, which increase the demand for air conditioning. This means burning more coal to generate more electricity, which increases air pollution. The sunny, hot conditions associated with a summer drought also contribute to ozone and smog formation.

Tiny solid particles or liquid particles suspended in air are called aerosols. These aerosols include soot, dust and sulfate particles, and are what we commonly think of when we talk about air pollution. Aerosols come, for example, from the burning of fossil fuels and wood, industrial and agricultural processes, and the accidental or deliberate burning of fields and forests. They can be hazardous to both human health and the environment.

Aerosols reflect light into space and affect the surface temperatures of the earth. They also alter the formation of clouds and affect the amount of precipitation. Along with greenhouse gases, they have a major effect on climate change.

Researchers at the University of Maryland have recently discovered a complex relationship between aerosols and rainfall. The fine particulate matter associated with air pollution reduces gentle rains, but also makes severe storms worse. This discovery emphasizes the need to control sulfur, nitrogen, and hydrocarbon emissions.

In thin clouds, rainfall occurrence is suppressed by large amounts of aerosols. On the other hand, thick thunderstorm clouds may reach twice as high in polluted air as they would under clean air conditions. This means that, for thick clouds, rainfall is increased by aerosols. The discovery can be summarized this way: Light rain is suppressed by aerosols, but heavy rain is enhanced by aerosols.

Here's how it works: Water vapor condenses on aerosol particles to form cloud drops. In clean air, the cloud drops are larger and have better chances of colliding to form large rain drops. In polluted air, many more drops of smaller size are formed. The smaller drops float in the air and are slow to accumulate into rain drops. With a small amount of moisture, most cloud drops never become large enough fall to earth, and the amount of rainfall is reduced.

In heavy clouds with moist polluted air, the drops freeze at higher altitudes to form ice crystals or hail. The energy released by freezing causes the clouds to grow taller and create larger ice particles that produce more intense rainfall. This partially explains the cycle in which air pollution can make a drought worse which makes air pollution worse, thus prolonging the drought.

Organization

Our twitter handle is: @KickapooEnviro

Our Facebook page is: www.facebook.com/KickapooEnvironmentalOffice

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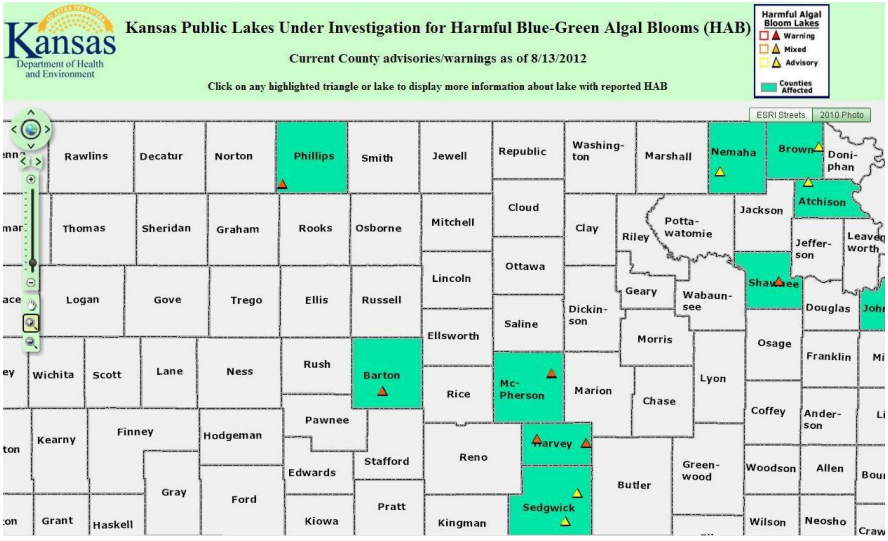
Working Together for a Better Community!

We're on the Web!

http://ktik-nsn.gov



High levels of blue-green algae exposure may cause intestinal, respiratory or skin irritation problems for humans. Pets may display symptoms of lethargy, vomiting, diarrhea, convulsions, difficulty breathing and general weakness.

Blue-green Algae (Cyanobacteria)

On July 20th 2012 the Kickapoo Environmental Office (KEO) was asked by Tribal Council and Water Plant personnel to check into a possible Blue-green algae bloom on the Delaware River within the Kickapoo Service Area. The Kickapoo Environmental Office took samples on July 20th and 23rd.

The KEO conducted a jar test with the samples it had collected. The test was questionable, so we proceeded to contact the Kansas Department of Health and Environment (KDHE) to request assistance. On July 24th KDHE had a specialist come and take samples for lab analysis. According lab analysis there was no indication of Blue-green algae. If there were any Blue-green algae it has probably floated down stream. The KEO will be looking into purchasing ELISA Blue-green algae sampling kits to better serve the citizens of the Kickapoo Tribe in Kansas.

According to Kansas Department of Health and Environment (KDHE) Blue-green algae naturally exist in all surface water bodies. Despite their name, blue-green algae are actually types of bacteria known as Cyanobacteria. In the right conditions (high nutrient and light levels) Blue-green algae are able to reproduce rapidly thus creating a dense growth called a bloom. Yet, all Blue-green algae blooms are not harmful. It is harmful when the blooming organisms contain toxins, and other noxious chemicals, pathogens, or other impacts to reaction or economic activities.

KDHE performs sampling of recreational bodies of water for cyanobacteria once alerted to a potential bloom. KDHE has the capability to test for microcystin toxin and to quantify and identify the type of cyanobacteria present. When a Harmful Algal Bloom (HAB) has been properly identified in a Kansas public lake, KDHE will issue either a Public Health Advisory of Public Health Warning, depending on the risk associated with the HAB as determined through water sampling and testing. The issuing of a Public Health Advisory or Public Health Warning is based on the concentration of microcystin toxin or cyanobacteria cell counts.

The main differences between a Public Health Advisory and a Public Health Warning are:

A. the level of risk that needs to be communicated to the public; and

B. recommended actions to the governing authority of the affected body of water to discourage exposure.

Proper governing authority of the affected body of water will implement appropriate measures to restrict exposure. There is more information about Blue-green algae on KDHE website: http://www.kdheks.gov/algae-illness/. If you have any questions, please feel free to contact our office.